UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,469	03/10/2001	Robert E. Sobol	10005185-1	7249

7590 11/01/2004	EXAMINER
HEWLETT-PACKARD COMPANY	SHERALI, ISHRAT I

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ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
Office Action Summary		09/803,469	SOBOL ET AL.
		Examiner	Art Unit
		Sherali Ishrat	2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *14 June 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Response to Arguments

1.   This action is in response to arguments received on 6/14/2004.

Applicant's arguments are fully considered however they are not persuasive with

respect to art rejection. See the remarks section for detail discussion.

Regarding claims 24-41, based on the persuasive arguments, rejection of claims

24-41 under 35 U.S.C § 112 first paragraph is withdrawn.

Regarding claims 9-13, 18-22, 28-32 and 37-41, arguments with respect to

rejection under 35 U.S.C §112 first paragraph is not persuasive.   See the remarks

section for detail discussion.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9-13, 18-22, 28-32 and 37-41 are rejected under 35 U.S.C § 112 first

paragraph, as failing to comply with enablement requirement.

Regarding claims 9, 18, 28 and 37, they recite "multiple tables are used to

modify, the small contrast difference and modify the maximum contrast differences in

the original image as function of the distances between different areas". Specification

discusses in the form of abstract multiple tables on page 9, lines 8-10 and page10,

lines 10-12 and in figure 7 shows single tone map. However the specification does not

show the multiple tables and does not give detail how these tables are derived or

constructed. Claims 10-13, 19-22, 29-32 and 38-41 are dependent on claims 9, 18, 28

and 37. Therefore they are also rejected.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless —
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1-2 are rejected under 35 USC § 102 (b) as being anticipated by Rahman

et al. (Multi-scale retinex for color image enhancement, IEEE 0-7803-3258).

        Regarding claim 1, Rahman changing the dynamic range of an original image to

match closely match the dynamic range of the medium used for a reproduction

(Rahman, in page 1004, paragraph 2, left-column, lines 20-24, states "The MSR

combines the dynamic range compression of the small scale retinex with tonal rendition

of the large scale retinnex to produce an output" This corresponds to changing the

dynamic range of an original image to match closely the dynamic range of the medium

used for a reproduction); comprising

        modifying the contrast difference between different areas of the original image

(Rahman, in page 1004, paragraph 2, left-column, lines 33-37, states "graying of

areas of constant intensity occurs because the retinex enhances each color band as

function of its surrounds" , In the system of Rahman graying of constant intensity as function of its surround corresponds to modifying the contrast difference between different areas of the original image),

as a function of the distance between the different areas (Rahman, in page 1004, paragraph 2, left-column, lines 33-37, states "graying of areas of constant intensity occurs because the retinex process enhances each color band as function of its surround. The smaller values in the weaker channel get pushed up strongly". In the system of Rahman graying of areas of constant intensity based on function of its surround [smaller distance] corresponds to modifying the contrast difference between different areas of the original image as a function of the distance between the different areas because Rahman is graying area of constant intensity as function of its surrounding area which corresponds to closer distance).

Regarding claim 2, Rahman discloses the contrast differences are preserved for large distances between the different areas (Rahman, in page 1004, paragraph 2, lines 33-37, states "graying of areas of constant intensity occurs because the retinex process enhances each color band as function of its surround [neighboring area]" Rahman shows enhancing contrast of each color as a function of its surround i.e Rahman is enhancing contrast of surrounding/neighboring [small distance] pixels/area, because Rahman shows enhancing contrast of surrounding/neighboring areas/pixels therefore Rahman is preserving the contrast differences for large distances between the different areas) and ,

the contrast differences are enhanced for small distances between the different

areas (Rahman, in page 1004, paragraph 2, lines 33-37, "graying of areas of constant

intensity occurs because the retinex process enhances each color band as function of

its surround" Rahman shows enhancing contrast of each color as a function of its

surround i.e Rahman is enhancing contrast of surrounding/neighboring [small distance]

pixels/area).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 3-9, 14-18, 23-28, 33-37 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Rahman et al. (Multi-scale retinex for color image ehancement, IEEE

0-7803-3258) in view of Frankel et al. (US 4,384,336).

Regarding claim 3-4, 7-8, 16-17, 26-27 and 35-36 Rahman does not explicitly

disclose contrast difference are reduced for small distance between areas and very

small contrast difference are substantially eliminated only for small distance between

the different areas.

In the same field of endeavor Frankel disclose contrast differences are reduced

for small distances between different areas (Frankel in figure 1 shows comparing

radiance [contrast difference] between neighboring areas and Frankel in, col. 21, lines

16-23, states "illustrated threshold function is such that all input values between (-2)

and (+2) units inclusive produces the same out put value, such a threshold yield a ratio

of unity when the two radiance values [contrast difference] being compared are within a

specified percent of each other. This threshold removes the spatially slow changing

effects of illumination", Frankel is reducing contrast differences for small distance

[neighboring areas] by removing spatially slow changing effects [small contrast

differences for small distances/neighboring area]).

very small contrast difference are substantially eliminated only for small

distance between the different areas (Frankel in figure 1 shows comparing radiance

[contrast difference] between neighboring areas [small distance] and Frankel, in col. 21,

lines 16-23, "illustrated threshold function is such that all input values between (-2) and

(+2) units inclusive produces the same out put value, such a threshold yield a ratio of

unity when the two radiance values [contrast difference] being compared are within a

specified percent of each other" i.e Frankel is eliminating very small contrast difference

for small distances).

Therefore it would have been obvious to one having ordinary skill in the art at

time the invention was made to reduce/eliminate contrast differences for small distance

as shown by Frankel in the system of Rahman because such a process provide

elimination or reduction of false contrast differences between neighboring pixels/areas

due to illumination.

Regarding claim 5, 14, 23,   Rahman discloses changing the dynamic range of an

original image to match closely match the dynamic range of the medium used for a

reproduction (Rahman, in page 1004, paragraph 2, left-column, lines 20-24, states "The MSR combines the dynamic range compression of the small scale retinex with tonal rendition of the large scale retinnex to produce an output" This corresponds to changing the dynamic range of an original image to match closely the dynamic range of the medium used for a reproduction); comprising

modifying the contrast difference between different areas of the original image (Rahman, in page 1004, paragraph 2, left-column, lines 33-37, states "graying of areas of constant intensity occurs because the retinex enhances each color band as function of its surrounds", In the system of Rahman graying of constant intensity as function of its surround corresponds to modifying the contrast difference between different areas of the original image),

as a function of the distance between the different areas (Rahman, in page 1004, paragraph 2, left-column, lines 33-37, states "graying of areas of constant intensity occurs because the retinex process enhances each color band as function of its surround. The smaller values in the weaker channel get pushed up strongly". In the system of Rahman graying of areas of constant intensity based on function of its surround [smaller distance] corresponds to modifying the contrast difference between different areas of the original image as a function of the distance between the different areas because Rahman is graying area of constant intensity as function of its surrounding area).

Rahman has not explicitly disclose limiting the maximum contrast differences between different area of the original input image.

In the same field of endeavor Frankel discloses limiting the maximum contrast differences between different area of the original input image (Frankel in figure 1 shows comparing radiance [contrast difference] between neighboring areas and Frankel, col. 10, lines 54-56, "A preferred practice is to reset each resultant ratio of radiance of paired of pixels which exceeds the maximum value" , the ratio of radiance of paired pixel with maximum contrast difference will have a value exceeding maximum value which is resetted in the system of Frankel. This corresponds to limiting the maximum contrast differences between different area of the original input image).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to limit the maximum contrast differences between different area [neighboring areas] as shown by Frankel in the system of Rahman because such a process provide a system for mapping of dynamic range from one image display device to other display device with limited dynamic range.

Regarding claim 6, 15, 25, and 34 Rahman discloses the contrast differences are preserved for large distances between the different areas (Rahman, in page 1004, paragraph 2, lines 33-37, states "graying of areas of constant intensity occurs because the retinex process enhances each color band as function of its surround [neighboring area]" Rahman shows enhancing contrast of each color as a function of its surround i.e Rahman is enhancing contrast of surrounding/neighboring [small distance] pixels/area, because Rahman shows enhancing contrast of only surrounding/neighboring areas/pixels therefore Rahman is preserving the contrast differences for large distances between the different areas) and ,

the contrast differences are enhanced for small distances between the different areas (Rahman, in page 1004, paragraph 2, lines 33-37, "graying of areas of constant intensity occurs because the retinex process enhances each color band as function of its surround" Rahman shows enhancing contrast of each color as a function of its surround i.e Rahman is enhancing contrast of surrounding/neighboring [small distance] pixels/area).

Regarding claim 9, 18, 28, and 37, Frankel discloses multiple look up tables to modify the small contrast differences and modify the maximum contrast differences as a function of distance between different area (Frankel figures 4-5 shows multiple look-up to modify the contrast differences based on the distances, modifying small contrast differences [Frankel in, col. 21, lines 16-23, states "illustrated threshold function is such that all input values between (-2) and (+2) units inclusive produces the same out put value, such a threshold yield a ratio of unity when the two radiance values {contrast difference} being compared are within a specified percent of each other. This threshold removes the spatially slow changing effects of illumination", Frankel is reducing contrast differences for small distance [neighboring areas] by removing spatially slow changing effects {small contrast differences for small distances/neighboring area} and modify the maximum contrast differences [Frankel, col. 10, lines 54-56, "A preferred practice is to reset each resultant ratio of radiance of paired of pixels which exceeds the maximum value" , the ratio of radiance of paired pixel with maximum contrast difference will have a value exceeding maximum value which is resetted in the system of Frankel).

Regarding claims 24 and 33, Rahman discloses modifying the contrast difference of the ratio function (See Rahman, page 1004, paragraph 2, lines 33-37, Raman show "graying of areas of constant intensity", In the system of Rahman graying of constant intensity modifying the contrast difference between different areas of the original image, Rahman is modifying areas of constant intensity [extremely low contrast] by graying [inducing difference in intensities] different areas of image and Rahman in page 1003, paragraph 2, lines 1-3, Rahman shows ratios in the form log subtraction which is same ratio of different area),

as a function of the distance between the different areas (See Rahman, page 1004, paragraph 2, lines 33-37, Rahman shows "graying of areas of constant intensity occurs because the retinex process enhances each color band as function of its surround" Rahman shows enhancing contrast of each color as a function of its surround i.e Rahman is enhancing contrast of surrounding/neighboring [small distance] pixels/area).

Rahman has not explicitly disclose limiting the maximum contrast differences of ratio function.

In the same field of endeavor Frankel discloses limiting the maximum contrast differences between different area of the original input image (See Frankel, col. 10, lines 54-56, "to reset each resultant ratio of radiance of paired of pixels which exceeds the maximum value" and in Figures 1A-1D Frankel shows the ratio of neighboring pixels are compared, the ratio of radiance of paired pixel with maximum contrast difference will have a value exceeding maximum value which is resetted in the system

of Frankel therefore Frankel shows limiting the maximum contrast and Frankel in figures

1A-1D comparing neighboring pixels which have small distance i.e Frankel is limiting

the maximum contrast of pixels of small distances);

Therefore it would have been obvious to one having ordinary skill in the art at the

time invention was made to limit the maximum contrast differences between different

area [neighboring] of the original input image as shown by Frankel because such a

process provide a system for mapping of dynamic range from one image display

device to other display device with limited dynamic range.

Allowable Subject

7.   Claims 10-13, 19-22, 229-32 and 38-41 are objected as being dependent on

rejected base claim but would be allowable if rewritten in independent form including

limitation of the base claim and any intervening claims.   Also provided that claims

overcome the rejection under 35 U.S.C § 112 first paragraph.

Remarks

8.   In the arguments received on 6/14/2004. Applicant argue the following:

a.   The independent claims, 1, 5, 14, 23-24 and 33 all contain the limitation that

contrast differences are modified as a function of the distance between different areas.

Rahman does not disclose contrast differences are modified as a function of the

distance between different areas. Retinex process does operate as a function of

immediate surrounding.

Examiner strongly disagree with Applicant's interpretation of Rahman's reference. Rahman, in page 1004, paragraph 2, left-column, lines 33-37, states "graying of areas of constant intensity occurs because the retinex process <u>enhances each color band as function of its surround.</u> The smaller values in the weaker channel get pushed up strongly".   In the system of Rahman graying of areas of constant intensity based on function of its surround [smaller distance] corresponds to modifying the contrast difference between different areas of the original image as a function of the distance between the different areas because Rahman is graying area of constant intensity as function of its surrounding area.   Surround in the system of Rahman corresponds to neighboring areas/surrounding areas, which includes immediate surrounding areas.

b.   The look-up tables corresponds to a tone map as plotted in figure 7. Tone maps are look up tables. Therefore it is obvious that specification shows multiple look-up tables.

Examiner agrees with Applicant that figure 7, shows tone map, which corresponds to a look–up table for modifying contrast differences. However Applicant has not shown multiple tone maps, corresponding to multiple look-up table. Neither Applicant has shown division of tone map of figure 7 and nor Applicant has shown any motivation or advantage of dividing of tone map of figure 7 to construct multiple look-up tables.

Conclusion

9.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

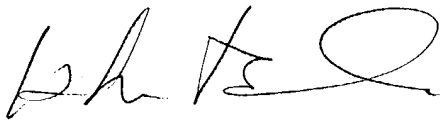than SIX MONTHS from the mailing date of this final action.

Communication

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Sherali Ishrat whose telephone number is 703-308-

9589. The examiner can normally be reached on 8:00 AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

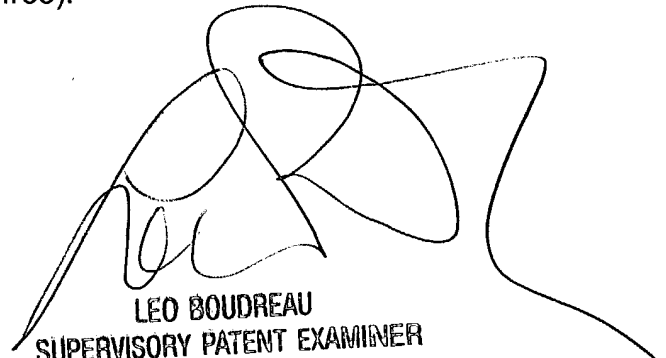Business Center (EBC) at 866-217-9197 (toll-free).

Ishrat Sherali

Patent Examiner

Art Unit 2621

October 19, 2004

LEO BOUDREAU
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